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<b>9</b> /	Apı	plication Number	10/824,059	•
	Fili	ng Date	April 13, 2	004
TRANSMITTAL FORM	Firs	st Named Inventor	Behzad Da	ariush
(to be used for all correspondence during pendency of filed application)	Gro	oup Art Unit Number	3738	
	Exa	aminer Name	Not Yet Kı	nown
Total Number of Pages in This Submission 9*	Atto	orney Docket Number	23085-088	87
ENCLOSURES	(C	heck all that apply	·)	
Fee Transmittal Form (in duplicate) Check Enclosed  Return Receipt Postcard Response to Notice to File Missing Parts Assignment & Recordation Cover Sheet Declaration Power of Attorney Application Data Sheet Supplemental Information Disclosure Statement & PTO/SB/08A Copies of IDS Cited Non-Patent Reference Request for Corrected Filing Receipt Request for Correction of Recorded Assignment Amendment/Response: [ ] Page(s)  After Final Status Request Revocation and Substitute Power of Attorney		Issue Fee Transm Letter to Chief Dra Formal Drawing(s  [ ] Sheet(s) Appeal Communic Interferences Appeal Communic (Appeal Notice, E Certified Copy of	aftsperson i): ) of Figure(s) [ cation to Board cation to Grou Brief, Reply Bri Priority Docum	d of Appeals and p ief) nent(s)
SIGNATINGE OF	ΔΤΤ	ORNEY OR AGEN	<b>T</b> .	
Signature:		OTIVE T OIT AGEN		
Attorney/Reg. No.: John T. McNelis, Reg. No. 37,186			Dated:	ZI June 2006
CERTIFICA  I hereby certify that this correspondence, including the enclosures i first class mail in an envelope addressed to: Commissioner for Pate If the Express Mail Mailing Number is filled in below, then this corre "Express Mail Post Office to Addressee" service pursuant 1037 CF	dentif ents, espon	P.O. Box 1450, Alexandria, 'dence is being deposited with	VA 22313-1450	on the date shown below.
Signature:				
Typed or Printed Name: John T. McNelis  Express Mail Mailing Number (ontional)		<u> </u>	Dated:	22 June 2006

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CANT:

Behzad Dariush

APPLICATION NO.:

10/824,059

FILING DATE:

April 13, 2004

TITLE:

Gravity Compensation Control System and Method Using Multiple

Feasibility Parameters

**EXAMINER:** 

Not Yet Known

**GROUP ART UNIT:** 

3738

ATTY. DKT. NO.:

23085-08887

### **CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner For Patents, P.Q. Box 1450, Alexandria, VA 22313-1450, on the date shown below:

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7.7 June 2006

John T. McNelis, Reg. No.: 37,186

MAIL STOP AMENDMENT COMMISSIONER FOR PATENTS P.O. BOX 1450 **ALEXANDRIA, VA 22313-1450** 

# SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT Under 37 CFR §§ 1.56 and 1.97-98

SIR:

Pursuant to the provisions of 37 CFR §§ 1.56 and 1.97-98, enclosed herewith is modified form PTO/SB/08A listing references for consideration by the Examiner.

The filing of this Information Disclosure Statement shall not be construed as a representation regarding the completeness of the list of references, or that inclusion of a reference in this list is an admission that it is prior art or is pertinent to this application, or that a search has been made, or as an admission that the information listed is, or may be considered to be, material to patentability, or that no other material information exists, and shall not be construed as an admission against interest in any manner.

This Information Disclosure Statement is being filed:

$\boxtimes$	within three months of the filing date of the application, or date of entry
	into the national stage of an international application, or before the mailing
	date of a first office action on the merits, whichever event last occurred;
	before the mailing of a first official action after the filing of a request for
	continued examination (RCE) under 37 CFR 8 1 114

after th	hree mo	onths of the filing date of this national application or the date
of enti	ry of the	e national stage in an international application, or after the
mailin	g date	of the first official action on the merits, whichever event last
occurr	ed, but	before the mailing date of the first to occur of either: (1) a
final a	ction u	nder 37 CFR §1.113; or (2) an action that otherwise closes
prosec	ution i	n the application, and:
	attac	hed hereto is the fee set forth under 37 CFR §1.17(p) for
	subm	nission of this Information Disclosure Statement under 37
	CFR	.§ 1.97(c); OR
	Appl	icant certifies pursuant to 37 CFR § 1.97(e) that:
		each item of information contained in this Information
		Disclosure Statement was first cited in a communication
		from a foreign patent office in a counterpart foreign
		application not more than three months prior to the filing of
		this Statement; OR
		no item of information contained in this Information
		Disclosure Statement was cited in a communication from a
		foreign patent office in a counterpart foreign application
		and, to the knowledge of the person signing this
		certification after making reasonable inquiry, no item of
		information contained in this Statement was known to any
		individual designated under 37 CFR § 1.56(c) more than
		three months prior to the filing of this Statement;
on or	before	the payment of the issue fee but after the mailing date of the
first t	o occur	of either: (1) a final action under 37 CFR § 1.113; (2) a
notice	e of allo	owance under 37 CFR § 1.311; or (3) an action that otherwise
closes	s prosec	cution in the application, and:
	Appl	icant certifies pursuant to 37 CFR. § 1.97(e) that:
		each item of information contained in this Information
		Disclosure Statement was cited in a communication from a
		foreign patent office in a counterpart foreign application not
		more than three months prior to the filing of this Statement;
		no item of information contained in this Information
		Disclosure Statement was cited in a communication from a
		foreign patent office in a counterpart foreign application
		and, to the knowledge of the person signing this

		certification after making reasonable inquiry, no item of
		information contained in this Statement was known to any
		individual designated under 37 CFR § 1.56(c) more than
		three months prior to the filing of this Statement; AND
		attached hereto is the fee set forth under 37 CFR §1.17(p) for
		submission of this Information Disclosure Statement under 37
		CFR.§ 1.97(d); OR
		after the payment of the issue fee. Applicant requests that the information
		contained in this Information Disclosure Statement be placed in the file
		according to 37 CFR § 1.97(i), although the information may not be
		considered by the USPTO.
		Enclosed is a copy of each listed reference that may be material to the
		examination of this application, and for which there may be a duty to disclose.
		This application relies, under 35 U.S.C. § 120, on the earlier filing date of prior
		application No, filed on, and the references cited therein are
		hereby referenced, but are not required to be provided in this application under 37
		CFR § 1.98(d).
	$\boxtimes$	Copies of any foreign patent documents and non-patent literature cited herein are enclosed.
		Each item of information contained in this Information Disclosure Statement was
		cited in a communication from a foreign patent office in a counterpart application,
		and the communication was not received by any individual designated in 37 CFR
		§ 1.56(c) more than thirty days prior to the filing of this Information Disclosure
		Statement. 37 CFR § 1.704(d).
	$\boxtimes$	Applicant submits that no fee is required for the consideration of this Information
		Disclosure Statement.
	Consid	deration of the listed references and favorable action are solicited.
		Respectfully submitted,
		BEHZAD DARIUSH
D . 1	21	June 2006 By: John !
Dated:		John T. McNelis, Reg. No.: 37,186
		Fenwick & West LLP
		Silicon Valley Center
		801 California Street
		Mountain View, CA 94041
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Substitute for form 1449A/PTO

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Complete if Known						
Application No.	10/824,059					
Filing Date	April 13, 2004					
First Named Inventor	Behzad Dariush					
Art Unit	3738					
Examiner Name	Not Yet Known					
Attorney Docket Number	23085-08887					

	U.S. PATENT DOCUMENTS							
		Document No.						
Examiner Initials*	Cite No. <sup>1</sup>	Number – Kind Code <sup>2</sup> (if known)	Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document				
	A1	US-2005/0104548 A1	05-19-2005	Takenaka et al.				
	A2	US-2005/0102111 A1	05-12-2005	Dariush et al.				
	A3	US-2004/0158175 A1	08-12-2004	Ikeuchi et al.				
· · · · · · · · · · · · · · · · · · ·	A4	US-2004/0158175 A1	08-12-2004	Ikeuchi et al.				
	A5	US-6,785,591 B1	08-31-2004	Hansson				
	A6	US-6,750,866 B1	06-15-2004	Anderson III				
	A7	US-2004/0107780 A1	06-10-2004	Kawai et al.				
	A8	US 6,750,866 B1	06-15-2004	Anderson, Frank				
	A9	US-2004/0102723 A1	05-27-2004	Horst				
	A10	US-6,633,783 B1	10-14-2003	Dariush et al.				
	A11	US-6,505,096	01-07-2003	Takenaka et al.				
	A12	US-2003/0023415 A1	01-30-2003	Nakamura et al.				
	A13	US-2003/0018283 A1	01-23-2003	Dariush				
	A14	US-6,289,265	09-11-2001	Takenaka et al.				
	A15	US-6,161,080	12-12-2000	Aouni-Ateshian et al.				
	A16	US-6,152,890	11-28-2000	Kupfer et al.				
	A17	US-5,982,389	11-09-1999	Guenter et al.				
	A18	US-5,835,693	11-10-1998	Lynch et al.				
	A19	US-5,808,433	09-15-1998	Tagami et al.				
	A20	US-5,432,417	07-11-1995	Takenaka et al.				
	A21	US-5,362,288	11-08-1994	Razon				
	A22	US-5,136,227	08-04-1992	Nakano et al.				
	A23	US-5,044,360	09-03-1991	Janke				
	A24	US-4,834,200	05-30-1989	Kajita				
	A25	US-4,786,847	11-22-1988	Daggett et al.				
	A26	US-4,244,120	01-13-1981	Harris				

Examiner Signature		Date Considered	
Signature	·	Considered	

<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609.

Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>&</sup>lt;sup>1</sup>Applicant's unique citation designation number (optional). <sup>2</sup>See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. <sup>3</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup>Applicant is to place a check mark here if English language Translation is attached.

	Substitute for t	orm 1449	VPTO	Complete if Known			
INIEO		ı Die	CLOSURE	Application No.	10/824,059		
_	_			Filing Date	April 13, 2004		
STATEMENT BY APPLICANT				First Named Inventor	Behzad Dariush		
				Art Unit	3738		
				Examiner Name	Not Yet Known		
Sheet	2	of	5	Attorney Docket Number	23085-08887		

FOREIGN PATENT DOCUMENTS							
		Foreign Patent Document					
Examiner Initials*	Cite No.1	Country Code <sup>3</sup> – Number <sup>4</sup> Kind Code <sup>5</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T <sup>6</sup>		
	B1	JP 2000-249570	09-14-2000	Nippon Telegr & Teleph Corp			
	B2	RU 2 107 328 C1	03-20-1998	Nurislamovich, Latypov (English Abstract only)			
	B3	WO 00/35346	06-22-2000	Stanford University			

		OTHER REFERENCES – NON-PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T <sup>6</sup>
	C1	AGARWAL, S.K. et al., "Theory and Design of an Orthotic Device for Full or Partial Gravity-Balancing of a Human Leg	
		During Motion," IEEE Transactions on Neural Systems and Rehabilitation Engineering, June 2004, Vol. 12, No. 2.	
	C2	AKHLAGHI, F. et al., "In-shoe Biaxial Shear Force Measurement: the Kent Shear System," Medical & Biological Engineering & Computing, July 1996, Vol. 34, pp. 315-317.	
	C3	ANDERSON, Frank C., "Static and Dynamic Optimization Solutions for Gait are Practically Equivalent", Journal of Biomechancis, 2001, Vol. 34, pp. 153-161	
	C4	ANDERSON, F. et al., "Dynamic Optimization of Human Walking," <i>Journal of Biomechanical Engineering</i> , October 2001, Vol. 123, pp. 381-390.	
	C5	ANDERSSEN, R. et al., "Numerical Differentiation Procedures for Non-Exact Data," Numererische Mathematik, 1974, Vol. 22, pp.157-182.	
	C6	ATKESON, C.G., "Learning Arm Kinematics and Dynamics", Annual Reviews, Inc., 1989, Vol. 12, pp. 157-183	
	C7	BARUH, H., Analytical <i>Dynamics</i> , Chapter 7, Rigid Body Kinematics, McGraw-Hill, 1999, pp. 355-371.	
	C8	BLAYA, J., "Force-Controllable Ankle Foot Orthosis (AFO) to Assist Drop Foot Gait," February 2003, web.mit.edu/jblaya/www/MSthesis_final.pdf	
	C9	BRONZINO, J.D., ed., "The Biomedical Engineering Handbook", IEEE Press, 2 <sup>nd</sup> Ed. Vol. 2, 2000, Chapter 142, pp. 1-17	
	C10	BURDEA, G. ET AL., "Virtual Reality Technology", 1994, pp. 33-37, John Wiley and Sons, Inc.	
	C11	BUSBY, H.R. et al., "Numerical Experiments With a New Differentiation Filter," Transactions of the ASME - Journal of Biomechanical Engineering, November 1985, Vol. 107, pp. 293-299.	
	C12	CHAO, E.Y. et al., "Application of Optimization Principles in Determining the Applied Moments in Human Leg Joints During Gait," J. Biomechanics, 1973, Vol. 6, pp. 497-510, Pergamon Press, Great Britain.	
	C13	CRAIG, J.J., "Nonlinear Control of Manipulators," Introduction to Robotics Mechanics and Control, 2 <sup>nd</sup> . Ed., 1989, Chapter 10, PP. 333-361.	

Examiner Signature		Date Considered	
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<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609.

Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>&</sup>lt;sup>1</sup>Applicant's unique citation designation number (optional). <sup>2</sup>See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. <sup>3</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup>Applicant is to place a check mark here if English language Translation is attached.

	Substitute for fo	orm 1449.	A/PTO	Complete if Known		
INEO	DMATION	ם חופי	CLOSURE	Application No.	10/824,059	
			PPLICANT	Filing Date	April 13, 2004	
SIAI		) i Ai	PPLICANT	First Named Inventor	Behzad Dariush	
				Art Unit	3738	,
				Examiner Name	Not Yet Known	
Sheet	3	of	5	Attorney Docket Number	23085-08887	

OTHER REFERENCES - NON-PATENT LITERATURE DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T <sup>6</sup>			
	C14	CROWNINSHIELD, R.D. et al., "A Physiologically Based Criterion Of Muscle Force Prediction In Locomotion," Journal of				
		Biomechanics, Vol. 14, No. 11, 1981, pp. 793-801.				
	C15	CULLUM, J., "Numerical Differentiation and Regularization," SIAM J. Numer. Anal., June 1971, Vol. 8, No. 2, pp. 254-265.				
	C16	DARIUSH, B. et al., "Multi-Modal Analysis of Human Motion From External Measurements," Transactions of the ASME, June 2001, Vol. 123, pp. 272-278.				
	C17	DARIUSH, B, "A Novel Algorithm For Generating A Forward Dynamics Solution To The Traditional Inverse Dynamics  Problem," In 4th World Congress of Biomechanics, Calgary, Canada, 2002.				
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	C20	DELP, S. et al., "A Computational Framework for Simulating and Analyzing Human and Animal Movement," IEEE  Computing in Science and Engineering, Vol. 2, No. 5, 2000, pp.46-55.				
	C21	DOHRMANN, C.R. et al., "Smoothing Noisy Data Using Dynamic Programming and Generalized Cross-Validation"  Transactions of the ASME – Journal of Biomechanical Engineering, February 1988, Vol. 110, pp. 37-41.				
	C22	FLANAGAN, R.J., et al., "The Role of Internal Models in Motion Planning and Control: Evidence from Grip Force Adjustments During Movements of Hand-Held Loads", The Journal of Neuroscience, February 15, 1997, Vol. 17(4), pp. 1519-1528				
	C23	GIAKAS, G. et al., "A Comparison of Automatic Filtering Techniques Applied to Biomechanical Walking Data," J. Biomechanical 1997, Vol. 00, No. 00, 4 pages.				
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	C25	GROOD, E.S. et al., "A Joint Coordinate System for the Clinical Description of Three Dimensional Motions: Application to the Knee," Journal of Biomechanical Engineering, 1983, pp. 136-144, No. 105.				
	C26	GRUBER, K., et al., "A Comparative Study of Impact Dynamics: Wobbling Mass Model Versus Rigid Body Models", Journal of Biomechanics, 31 (1998), pp. 439-444				
	C27	HATZE, H. "The Use of Optimally Regularized Fourier Series for Estimating Higher-Order Derivatives of Noisy  Biomechanical Data," J. Biomechanics, 1981, Vol. 14, pp. 13-18.				
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	C29	HEMAMI, H., "A Feedback On-Off Model of Biped Dynamics", IEEE Transactions on Systems, Man, and Cybernetics, July				

Examiner Signature	Date Considered	
	l	

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Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹Applicant's unique citation designation number (optional). ²See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁴Applicant is to place a check mark here if English language Translation is attached.

	Substitute for	form 1449A/P	то	Complete if Known		
INIEO	RMATIO	N DISCI	OSLIDE	Application No.	10/824,059	
				Filing Date	April 13, 2004	
STATEMENT BY APPLICANT			LICANI	First Named Inventor	Behzad Dariush	
				Art Unit	3738	
				Examiner Name	Not Yet Known	
Sheet	4	of	5	Attorney Docket Number	23085-08887	

		OTHER REFERENCES - NON-PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T <sup>6</sup>
	<u> </u>	1980, Vol, SMC-10, No. 7, pp. 376-383	
	C30	HEMAMI, H. et al., "Modeling And Control Of Constrained Dynamic Systems With Application To Biped Locomotion In The	,
		Frontal Plane," IEEE Transactions on Automatic Control, Vol. 4, No. 4, August 1979, pp. 526-535.	
	C31	HEMAMI, H., "A State Space Model for Interconnected Rigid Bodies," IEEE Trans. on Automatic Control, 1982, pp. 376-382, Vol. 27, no. 2.	
	C32	HOSEIN, R. et al., "A Study of In-shoe Plantar Shear in Normals," Clinical Biomechanics, 2000, Vol. 15, pp. 46-53.	
	C33	HUNGSPREUGS, P. et al., "Muscle Force Distribution Estimation Using Static Optimization Techniques", Technical Report  - Honda R&D Americas	
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	C35	JEZERNK, S. et al., "Robotic Orthosis Lokomat: A Rehabilitation and Research Tool," Neuromodulation, 2003, pp. 108-115, Vol. 6, No. 2.	
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	C40	KLEIN, C. A. et al., "Review Of Pseudoinverse Control For Use With Kinematically Redundant Manipulators, <i>IEEE Transactions on Systems, Man, and Cybernetics</i> , Vol. 13, No. 2, 1983, pp. 245-250.	
	C41	PARK, J.H. et al., "Biped Robot Walking Using Gravity-Compensated Inverted Pendulum Mode and Computed Torque Control, 1998 IEEE Conference on Robotics and Automation, May 16-20, 1998, pp. 2528-2533, Vol. 4, [online] Retrieved from the Internet <url:http: abs_free.jsp?arnumber="680985" ieeexplore.ieee.org="" xpl=""></url:http:>	
	C42	PIAZZA, S. et al., "Three-Dimensional Dynamic Simulation of Total Knee Replacement Motion During a Step-up Task,"  Journal of Biomechanical Engineering, Vol. 123, 2001, pp.599-606.	
	C43	RAHMAN, T. et al., "A Simple Technique to Passively Gravity-Balance Articulated Mechanisms," Journal of Mechanical Design, 1995, pp. 655-658, Vol. 117, No. 4.	
	C44	RUNGE, C.F. et al., "Estimating Net Joint Torques From Kinesiological Data Using Optimal Linear System Theory." IEEE Transactions on Biomedical Engineering, December 1995, Vol. 42, No. 12, pp. 1158-1164.	
	C45	SHADMEHR, R. et al., "Interference in Learning Internal Models of Inverse Dynamics in Humans," Advances in Neural	

Examiner	Date	
Signature	Considered	

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	Substitute for	form 1449	A/PTO	Complete if Known		
INEO	DMATIO	אום וא	CLOSURE	Application No.	10/824,059	
				Filing Date	April 13, 2004	
STATEMENT BY APPLICANT			PLICANI	First Named Inventor	Behzad Dariush	
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Sheet	5	of	5	Attorney Docket Number	23085-08887	

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		Information Processing Systems, 1995, pp. 1117-1224, Chapter 7.	
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